THE REVOLUTION OF THOUGHT:

FROM MYTHOLOGY TO HELLENISTIC SCIENCE

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1. INTRODUCTION

1. 1. Importance of Greek philosophy to contemporary thought

Why is the study of Greek philosophy and science a good way to introduce ourselves into contemporary thought? Not only because it was then and there when philosophy originated, but also because the problems the Greek philosophers studied were, in many respects, the same that the history of philosophy and science will discuss during centuries, and specially because those issues influence deeply our current ways of living, thinking and behaving in the so called Western World. The way of stating the problems and the solutions will vary over the years, but the core of the issues continues to be the same.

In fact, Greek philosophy is the origin of western culture and its institutions: art, religion, mathematics, natural sciences, ethics, education, politics, economics, law, linguistics, etc. Almost all of the conflicts and solutions that govern the history of the West can be traced to Greek philosophy. In other words, the Greeks are our intellectual sources. As Heidegger said, "The Greeks are we".

Greek philosophy begins in the sixth century B.C. How was the world like then? Karl Jaspers, a German philosopher, describes that period as an axial time for humanity. There was a big existential crisis all over the world, which resulted in profound changes that were different in each context: Lao-Tse and Confucius in China, Buddha in India, Zoroastro in Persia, the Prophets in Israel, and the Presocratics in Greece. As you can see, they all represent different approaches to the question of human life. Well, the peculiarity of the Greek way of solving the crisis was the appeal to

philosophy, science, and democracy. Henceforth, those areas will constitute central topics of western thought during centuries. Due to time restrictions, we will here part from the study of democracy and focus on the origin of philosophy and science against the roots of mythology.

1.2. Birth of philosophy and science

Science and philosophy arose in Greece around the sith century before our era. It was not by chance. They appeared as the result of a new attitude towards reality. This new attitude involved looking for rational explanations to substitute mythological and religious explanations which had traditionally been accepted. The fact has been defined as the transition from myth to logos: it means the substitution of mythological explanations of any event for the ultimate appeal to reason.

Mythological explanations rely on gods and goddesses or on natural facts that have been divinized. Thus, everything that occurs in nature (storms, waves, etc.) or in human lifes (madness, betrayal, love, etc.) is ultimately due to divine actions. The gods' will, capricious and arbitrary, determines universal destiny. Since myth is an imaginary story, it is not provable; its strength lies primarily on the importance of tradition, on a custom which is not to be questioned.

On the other hand, rational explanations or logos interpret everything that happens as natural phaenomena. Natural phaenomena have nothing to do with divine intervention; they are alien to it. They do not occur due to a divine will or arbitrariousness, rather they are subject to strict regularity and necessity. Casuality, not chance, governs the realm of nature. Thus, everything that happens is subject to rules, and the task of reason (logos) is to discover and to analyze those rules or laws. Hence rational explanation is not based on tradition, but on arguments and reasoning. It does not matter how many people believe or share a given explanation, nor whether an explanation comes from the old past; what really matters is whether it can be justified by good reasons.

The greek notion of knowledge has its roots in this distinction between myth and logos. Against mythological explanations and more or less grounded opinions, Greeks began to sustain a notion of knowledge as justified true belief (JTB), that is, a belief or opinion that is true, and that is based on reasons which warrant its truth. My belief, if it is to be justified, cannot be a mere guess or hunch or arbitrary conviction. It cannot be merely a product of wishful thinking or something I read on the slip from a fortune cookie. Instead, there must be some sort of reasonably cogent reason or

ground or warrant for my belief. For example, if I say that there is a dog now on the corridor, and it just happens to be one there, my claim was true, but it was not knowledge since I was right only by chance. But if I say that there is a dog because I heard it barking, then I am giving a reason that justifies my claim. I thus have knowledge. I can claim to know it.

Now, Greeks consider philosophy and science as types of knowledge. Unlike myths, science and philosophy had both to justify their claims, argue for them, warrant them.

2. MYTH

We probably all remember the Olympic gods (Zeus, Hera, Athena, Dionysus, Apollo, Hades, Eolus, Chronos, Poseidon) and heroes (Ulysses, Hector, Paris, Achilles, Prometheus, Helen, Penelope, Heracles). Homer tells us about them in *Iliad* and *Odyssey*, and Hesiod does the same in his works *Theogony* and *Works and Days*.

But what exactly is myth? Myth, like magic, imply a first attempt to bring supernatural forces under some measure of control. They both try to fix the unseen powers in more definite shape and to endow them with more concrete substance. They thus become detached from the things in which at first they resided, and are filled out into complete persons.

Myth is a first attempt to understand the world and the place of human beings within it. It is therefore a tale or story mostly about the origins. It contains a “cosmogony” or a narration about origins that identifies natural facts with divine agents and that includes supernatural facts. It also refers us to the idea of "chaos": the world is governed by the desires of gods, that is, by arbitrariness and contingency. Since events are not calculable, Fate or Destiny are crucial for humans and for gods alike.

Myth is also a legend to be believed. One cannot disagree with the tradition received. One does not discuss myth, does not try to prove it or deny it, because myth does not have to do with reason.

{After defining myth, let us talk now about those features that define reason, so that we can later compare both approaches to reality.}

3. THE RISE OF REASON

The English word "reason" (or the Spanish term “razón”) comes from the Latin word "ratio", and this from the Greek term "logos", which means calculation, proportion, measure or measurement of money or goods. Nowadays, the semantic field of “reason” covers rational thinking, argumentative reasoning, positive thinking, abstract thinking, generalization from concrete data, induction and deduction, among other meanings.

The birth of reason is marked by the tacit denial of the distinction between two orders of knowledge, experience and revelation, and between the two corresponding orders of existence, the natural and the supernatural. When we give a rational explanation of reality, we offer a “cosmo-logy”, that is, an explanation of the universe based on logos-reason. The idea of "cosmos" (order) is the idea of a world governed by natural, logical and ethical laws. It is possible to predict nature because there is necessity and regularity in the course of events. Besides, a rational theory is a theory that can be challenged and discussed.

Now, it is important to understand that reason does not emerge as a sudden discovery or revelation. There is a historical continuity between myth and reason. For example, the first physics and cosmologies developed in Greece (by the Naturalists or Milesians) tried to escape to myth and individual gods, but they still interpreted the causes of movement and stability as animated powers, similar in many respects to divine powers. Thus, there will always be traces of myth in philosophical and scientific constructions in Ancient Greece, where logical reasoning and mythical reasoning helped each other. {By the way, myth will always play a role in every culture and can never be completely overcome. In general, one could even consider that every culture has its kind of mythical thinking.}

However, in its essence, rational thinking opposes mythical thinking, and consequently criticizes the society that lives according to myth. For example, it attacks anthropomorphic politeism. As Xenophanes said, "If horses or oxen had hands and could draw or make statues, horses would represent the forms of the gods like horses, oxen like oxen."

4. PHILOSOPHY AND SCIENCE

Reason appeared in Greek culture under the shape of philosophy and science. During those

centuries, there was no sharp distinction between them. The first scientists were philosophers and vice versa, the first philosophers were scientists.

In this context, it is interesting to pay attention to the meaning of the term "philosophy", composed in Greek by the roots "philo" + "sophia", which meant love of wisdom, love of truth, love of science.

The rise of science and philosophy was possible because the intelligence became disinterested and now felt free to fly away from immediate problems of action. Reason sought and found truth that was universal, but might or might not be useful for the needs of life. Philosophy and science can thus be seen as the latest of human's great achievements.

The Greeks wanted to understand the world that surrounded them. They thus needed to find a way to classify the events. Other antique peoples, like the Egyptians or the Mesopotamians, had only been able to catalog or record different events. But a mere list does not help much to understand the events. The Greeks realized that to understand the world they needed to simplify the enormous variety that can be found in the world of events. They managed to do so by using the following notions: unity and multiplicity, simplicity and variety, permanence and change, continuity and discontinuity.

The geniality of the Greeks was to raise questions about the plurality (many tokens), the variety (many classes), and the change of things around them. They introduced abstract thinking and generalization based on observations. They thus searched for basic stuff or matter, for the origin or cause of change, and for laws in nature. Science and philosophy begin with the discovery that the universe is a natural whole (not partly natural and partly supernatural) with unchanging ways of its own that can be ascertainable by human reason.

Science and philosophy imply the discovery that external objects have neither sympathy nor hostility towards human passions and desires. *Janua* is not a fully personal god presiding over doorways, but simply the spirit of 'doorness', conceived as a power present in all doors, that can help or harm one who passes through them. (Think, for example, of a child kicking a door that has pinched his finger.) There are no supernatural beings that are accessible to prayer and sacrifice or amenable to magical compulsion to satisfy our desires. Thought is left confronting Nature, an impersonal world of things, indifferent of human's desires.

Understanding the world involves the discovery of natural laws, and forces us to ask how our conception of ourselves fits into our understanding of the rest of nature. The first philosophers seek to know and understand the world, and they soon raise questions about our resources for gaining knowledge, and about the relative importance of observation and theory, or sense-perception and reason, as sources of knowledge. Questions about sources of knowledge stimulate epistemology (theory of knowledge), while doubts about the possibility of knowledge provoke skeptical reactions.

5. THE NATURALISTIC MOVEMENT (THE PHYSICISTS, THE MILESIANS, THE PRESOCRATICS)

5.1. The naturalist outlook

Between the age of Homer (mid-eight century) and the age of Socrates (late fifth century), the Greeks began systematic rational study of the natural and the moral order. Aristotle distinguishes those who talk about gods and offer poetic or mythological accounts from those who offer rational accounts that can be seriously studied. He calls the second group ‘students of nature’ or ‘naturalists’, as opposed to Hesiod and his followers, because they abandon mythology to ask a new question, about the nature of things. Aristotle’s comments on the ‘mythologists’ are unsympathetic, indeed unfair; but he has good reason to believe that a new movement began with Thales, ‘the originator of this sort of philosophy’. Many have followed Aristotle in taking the naturalists to be the first philosophers and scientists.

5.2. Nature as matter

Aristotle claims that the naturalists identify the nature with the ‘matter’ or ‘basic stuff’ of things. We can always recognize a continuing subject in more extensive changes: if we make a square lump of bronze that was one centimetre wide into a round coin that is two centimetres in diameter, the very same lump of bronze is the continuing subject, its dimensions and shape alone having changed. The continuing subject may not be continuously observable as easily as the bronze is: if we cook oats and water to make porridge, the result may not look much like oats and water, but still they are what it is, and they are continuing subjects that have undergone change.

If we find the continuing subject of change, we seem to find the nature of things. If we take an ordinary subject (the porridge), we can ask what its nature is, or what the subject really is; and a reasonable answer will tell us what its basic, underlying subject is. We can say that porridge is oats and water that have been cooked together; this is a better answer than ‘Porridge is a sticky mess’ or ‘Porridge is light grey’, because it allows us to say how porridge came into being. It also allows us, in principle, to explain the properties and behaviour of the porridge; if we know what oats and water are like and how they interact, we can predict what will happen when porridge is eaten by someone with specific type of body. In Aristotle’s view, the naturalists want to explain the world as a whole in the same way. They want to find the nature of things by finding their basic matter.

In Homer the nature and constitution of things does not play the primary role in explaining what happens to them. He often explains events by some external divine agency affecting the sea to produce a storm, or affecting human bodies to produce a plague. In so far as they appeal to the nature and constitution of things, the naturalists assume that his Homeric view is mistaken. In their view, things seem random, or to require divine intervention, only because we do not know enough about the constituent stuffs and processes.

The naturalists apply their claims about nature to the understanding of the world as a whole and to the processes in the natural world. They were concerned with law and regularity in the universe and with the subject underlying natural processes.

(Examples of the naturalism: new outlook in history and medicine)

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5.3. The problems of method

The naturalistS could not have reached their views by traditional methods. The poets appeal ultimately to divine authority, to the Muses who are the source of the poet’s song, and who transmit to him a true memory (when they choose to). They appeal more directly to memory and tradition. If the naturalists had accepted this method of discovery and confirmation, they would never have reached their views, let alone persuaded anyone else to agree with them. That is why naturalists attack tradition and authority.

We might say –rather naïvely– that Homer's mythological world view cannot be justified by appeal to observation and experience. Hence, we might suppose, if we observe things more closely, we can see why things happen as they do on different occasions, and why Homer is wrong to describe them as he does. However, such simple-minded appeal to the value of observation could hardly vindicate the naturalists against Homer. For many naturalists do not study the phenomena they can observe. They speculate about the unobservable – the origin and destruction of the world, the nature of the heavenly bodies, and in general about how things might happen. They do not characteristically argue from observation and experience about how things actually do happen. The relative small role played by observation may seem to us to be surprising and regrettable. But if we examine the naturalists's attitudes to observation, we will see why their caution in appealing to it is more reasonable than we might think.

5.4. General laws

It should not be easier to see why the naturalists were right not to defend their arguments by a simple appeal to the evidence of observation. If they had attended too closely to observations, without relying on naturalist principles not derived from observation, they would never have formed scientific theories. Those who look at the world in a Homeric way will find it easy to reconcile their outlook with their experience and observation. If I get caught in a storm at sea, perhaps I have offended Poseidon and it will blow over if I make a sacrifice to him. If the storm does not blow over, my belief is not refuted, since I have other explanations ready. Perhaps Poseidon was too angry to be appeased, or my sacrifice was too small, or another god intervened, or this particular storm 'just happened' with no particular divine cause. If I hold this sort of view, it will be difficult to refute me by observation; indeed, I may well claim that naturalist assumptions about general laws violate the evidence of observation.

A more reflective attitude to observation suggests that our use of observation actually relies on theoretical principles of the sort that the naturalists discover. We think observation and experiment are informative because we expect that if we have once observed something we should be able to observe it again in the same circumstances. It would be pointless for us to attempt to confirm experiments by replicating them, if we did not agree with the naturalists' determinist assumption – that natural processes conform to general laws, and that apparent exceptions to these

laws are to be explained by further general laws.

The determinist assumptions of naturalism imply that systematic observation is important, in so far as it should help us to find the general laws in natural processes. But observations apparently cannot themselves support the naturalist against the Homeric outlook; and the naturalist therefore need some other defence of their outlook.

5.5. Reason and argument

Heracleitus raises some of the right questions in the theory of knowledge (epistemology).[1] He rejects the traditional appeal to the Muses, and does not want to be accepted as an authority. 'Don't listen to me', he says, 'but to the *logos*'. Grasp of the *logos* ('reason', 'account', 'argument' are all aspects of the meaning) is not the mere accumulation of information. Heracleitus criticizes excessive trust in the senses. Unquestioning confidence in the senses is like children's trust in what their parents tell them, reflecting failure to make a deeper inquiry.

Heracleitus contrasts sleeping and waking, to explain the contrast between the senses and the *logos*; and he suggests that the senses are good witnesses, if properly understood. We know that we live in a world that is common to all, and that we see bodies – external realities that continue to exist even when we do not see them. If we rely on our apparent sensory experience, we must believe all our dreams and hallucinations, but if we do that, we will never reach any conception of a common world. In deciding that my dreams are unreliable, I assume that the world conforms to the general laws that seem to be violated in my dream experience.

Naturalist cosmology applies to the same *logos* that underlies our common-sense contrast between the objective world and our dreams. Cosmology seeks to discover regularity, law, and order in the world. We cannot, in Heracleitus' view, reject this demand for regularity unless we also reject our common-sense conception of an external objective world. Some claims of naturalist cosmology appear to conflict with experience and observation. But the apearance of conflict is misleading, and deceives only people with 'barbarian souls', those who refuse to apply critical intelligence to their experience. Heracleitus defends his views on the instability of things and the stability of processes, by general principles that we already apply to familiar situations.

[1] "You cannot step into the same river twice, for other waters are ever flowing on."

If Heracleitus is right, he has a strong argument against Homer. He could not defend determinist principles by appeal to observation; and any other argument might seem to be circular, by relying on the principles themselves. He argues, however, that Homer and common sense are really committed to naturalist principles already, in drawing the ordinary distinction between dreaming and waking; Homer fails to see that the ordinary distinction supports naturalism. Heracleitus' rational principles are the common *logos*, not merely his own preferences; they are not merely the product of authority or tradition, but we can all discover them if we understand the assumptions we already accept.

(The gods)

(DOUBTS ABOUT NATURALISM)

6. CONCLUSION

Greek thinkers considered philosophy (and science) as an essential activity. Doing philosophy means exercising criticism as long as one has strength. Loving wisdom is not compatible with certain ways of living. Philosophy arises as an activity that fights against the annihilation of critical consciousness.

As the Greeks conceived it, philosophy deals with two kinds of concerns. The first refers to the question, "What is real?" The answers search for identity behind difference (Nature of Being), or for the origin of movement and changes in nature (Causes of Being). The second refers to the question, "What am I?" The answers refer to related questions like "What can I know? What can I do? What can I hope?" (Kant).

In Greek philosophy the answers to both concerns are intertwined. Greek thought attempted to build a view of the world that would be compatible with a view of human existence. Thus, interest for human life and for nature go essentially together. As a consequence, philosophy of nature, epistemology, ethics, politics, and metaphysics are connected. To this respect, Greek thought differs from contemporary reflections upon the same subjects which are much more specialized and

compartmentalized.

Nowadays, we cannot make immediate sense of or find direct intuitive response to a question like "What is being?". Furthermore, we have understood the importance of the observer. Thinkers are now more cautious and feel themselves cut off from 'the' reality by a screen of language, concept, or custom. (...) But the ideal goal of speculative system, unity, coherence and simplicity continues to give direction to the actual adventure of our civilization.

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